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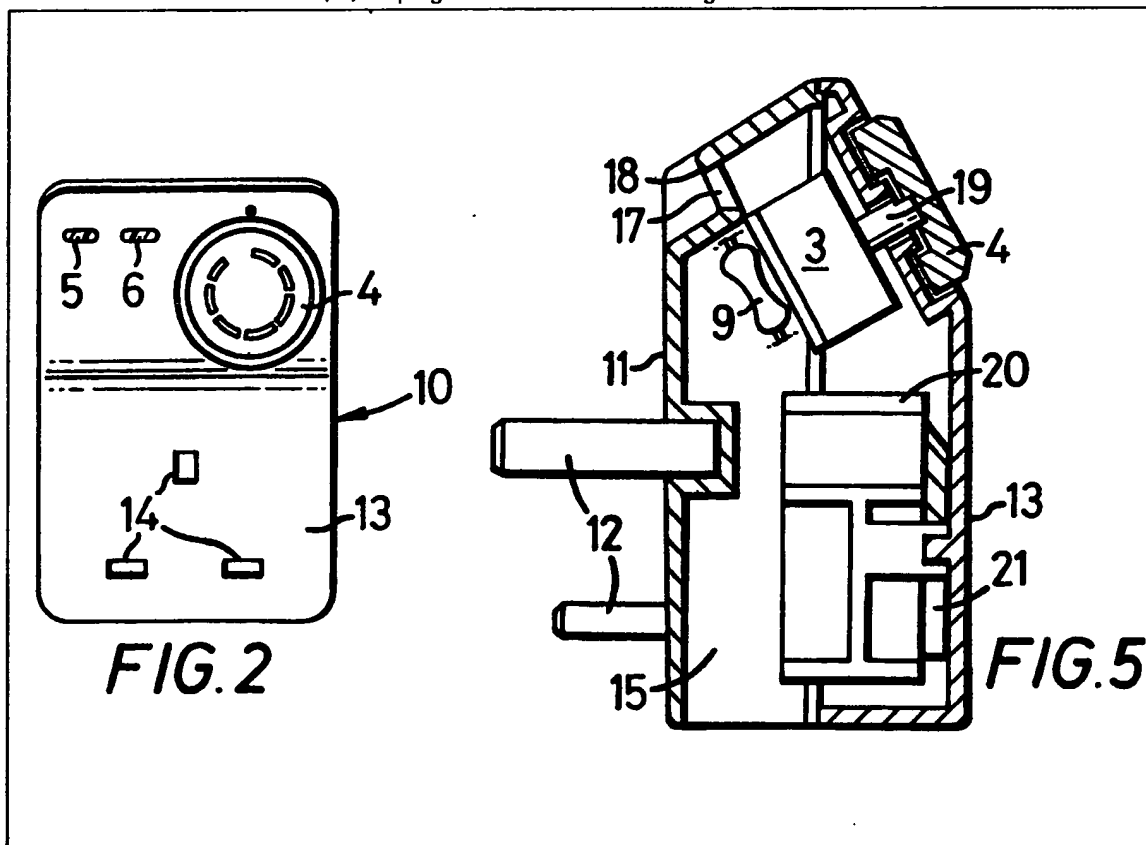
appliance comprises a body (10) having pins (12) for plugging into an electric socket, its own socket (20) by which the heater appliance may be plugged in, and thermostat contacts (3) controlled by manually adjustable setting means (4).

Accelerated heating of the thermostat contacts (3) is effected without dedicated components by arranging the thermostat contacts over said socket, whereby heat emanating and rising from the socket in use provides the main source of heat for accelerated heating. Vents (15, 17) allow an upward convective draught of said heat to play on the contacts (3).

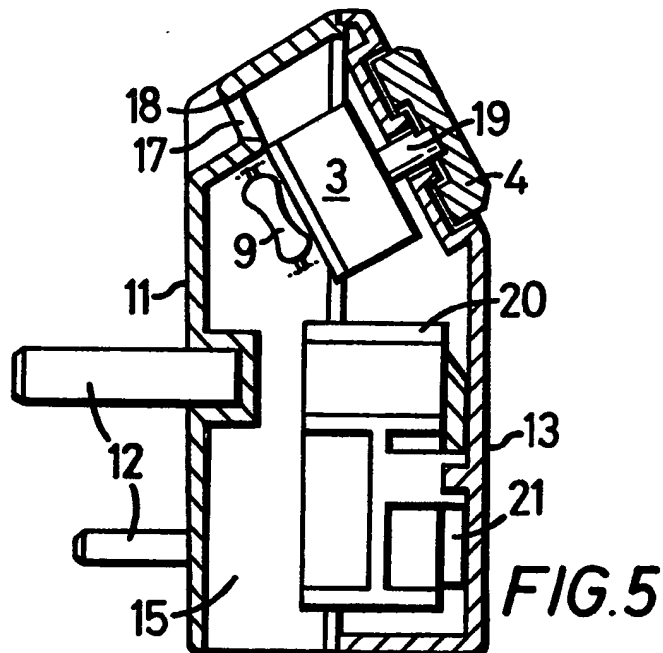
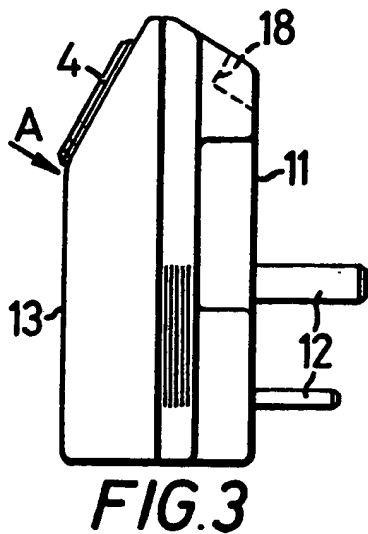
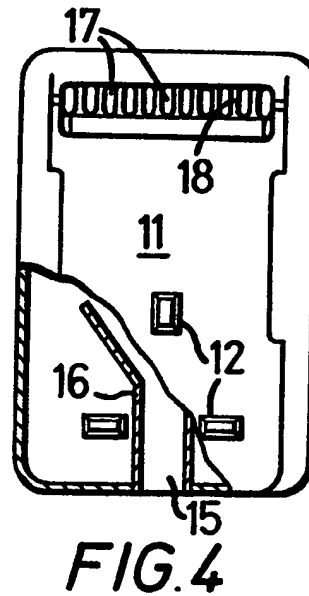
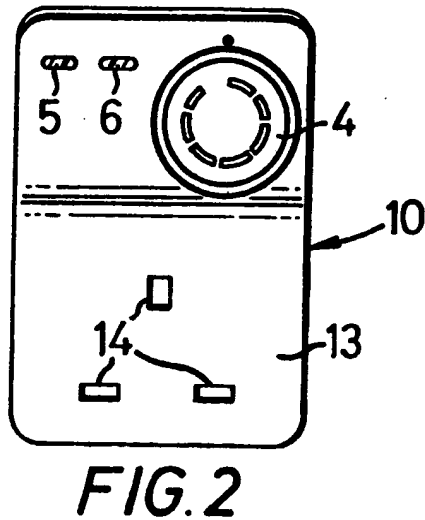
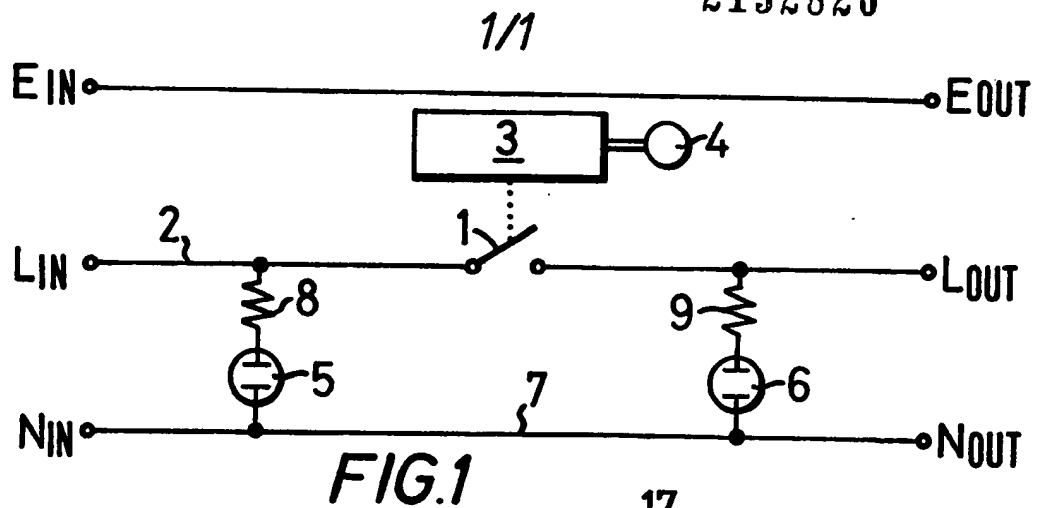
Where the thermostat has a load indicator circuit, comprising a neon indicator (6) and a resistance (9) connected in series, said resistance may be arranged near the contacts to supplement the heat emanating from said socket.

(54) Plug-in thermostat

(57) A plug-in thermostat for a heating



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SPECIFICATION

Plug-in thermostat

5 This invention relates to thermostats and has particular application to so called "plug-in" thermostats for controlling domestic electric heater appliances. Such a plug-in thermostat usually comprises a body provided with pins by which it may be plugged into
 10 an electric socket in the room to be heated, and with its own socket by which the heater appliance may be plugged in. Temperature control is normally provided by thermostat contacts incorporating a bi-metallic strip housed within the body, the temperature setting of which can be manually adjusted by
 15 setting means, for example, a calibrated dial. It is also usual to equip the thermostat with a load indicator for indicating when the socket of the thermostat is "live", i.e. indicating that the ambient
 20 air is below that set on the setting dial, said load indicator being extinguished automatically by the operation of the thermostat contacts when the ambient temperature reaches that set.

A problem with such plug-in thermostats is a
 25 tendency to overshoot the set temperature due to thermal lag. To counter this problem it is known to provide a separate accelerator heater dedicated to the thermostat contacts which is usually in the form of a resistance winding located around the thermostat contacts.
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An object of this invention is to provide a plug-in thermostat which caters for accelerated heating of the thermostat contacts without the need for separate accelerator heating means.

35 According to this invention such a plug-in thermostat is characterised in that the thermostat contacts are arranged within the body at a position over said socket whereby heat emanating and rising from the socket in use provides the source of heat for
 40 accelerated heating.

The contacts may be arranged immediately adjacent, and preferably vertically above, the thermostat socket.

Thus, heat emanating and rising from the socket
 45 when the heater appliance to be used therewith is plugged in and operating will be the main source for accelerated heating, thereby avoiding the need for separate dedicated components. Because the level of the heat from the plugged socket will tend to vary
 50 according to load, this can provide a measure of automatic adjustment of the degree of accelerator heating. Also in the event of a malfunction causing overheating of the plugged socket, the arrangement will serve automatically to quickly heat, and thereby
 55 open, the contacts to switch off the load. It will be appreciated here that the heat emanating from the socket in use is mostly generated by the fuse in the appliance plug connected to the socket, this heat being conducted by the live pin of the plug to the live
 60 conductor of the socket.

The circuit for the load indicator normally comprises a neon indicator and a resistance connected in series, and said resistance may also be arranged near the thermostat contacts whereby heat generated by the resistance when the thermostat is

on-load can be utilised to supplement the socket heat for accelerator heating.

According to an advantageous feature of the invention, the body of the thermostat can be provided with bottom and top parts defining vents so that convection currents produced by the heat emanating from said socket will cause an air draught to rise through a suitable passage through the thermostat body, and hence entrain said heat and guide it over the thermostat contacts.

In order that the invention may be readily understood, one embodiment of plug-in thermostat will now be described, by way of example, with reference to the accompanying drawing in which :-

80 *Figure 1* is a simplified circuit diagram of the plug-in thermostat,

Figure 2 is a true front view of the thermostat in the direction of the arrow A in *Figure 3*,

Figure 3 is a side elevation of the thermostat,

85 *Figure 4* is a rear elevation of the thermostat, partly broken away, and

Figure 5 is an enlarged sectional elevation of the thermostat.

Referring to *Figure 1*, the thermostat circuit comprises thermostat contacts in the form of a switch 1 included in the live line 2 which is actuated by a bi-metallic actuator 3, the temperature setting of which can be adjusted via setting means 4. Two neon indicator lamps 5 and 6 respectively are
 95 connected across the live line and neutral line 7, each neon lamp being in series with a resistor 8, 9 respectively of a suitable value to drop the supply voltage to the working value required by the lamps, e.g. for a 240V 50 Hz supply, a neon lamp of 0.06W and a resistor of 560 K/Ohms would be appropriate.

Referring now to *Figures 2* to *4*, the circuit is contained within a thermostat body 10, the rear face 11 of which has plug pins 12 projecting therefrom for connecting to a supply socket. The front face 13 towards the bottom thereof is formed with socket openings 14 for the plug of the heater appliance to be used therewith. On the upper part of said face 13 there is mounted the two neon lamps 5 and 6, the lamp 5 for indicating "mains-on" and the lamp 6 for indication "load-on", and the setting means, which is in the form of a round dial 4. From *Figure 4* it will be noted that an air entry vent 15 is formed in the bottom wall of the body 10 and an entry passage defined by internal walls 16 extends upwardly into
 115 said body and between the front and rear faces, the walls also serving as a safety barrier by blocking access to the socket terminals. A line of air exit vents 17 is formed in the upper part of the rear wall 11, these vents being provided in an inwardly angled face 18, see *Figures 3* and *5*, formed in the rear wall to prevent water ingress to the interior of the body 10.

Referring now to *Figure 5*, it will be seen that the setting dial 4 is connected via a drive spindle 19 to the bi-metallic actuator which is supported in the space vertically above the thermostat socket 20, and particularly the live terminal thereof, which socket is screened from its socket openings 14 in the normal manner via a sliding shutter 21. Also, the resistor 9 associated with the neon lamp is mounted
 130

adjacent the actuator 3,

Thus, in the use of the thermostat, heat emanating from the plugged socket 20, and particularly the live terminal thereof produced convection currents, and hence, an air draught is created which enters the vent 15, flows upwardly through the body 10, where it entrains the heat from the socket and passes it over the bi-metallic actuator 3, before existing through the vents 17. The arrangement enables accelerator heating to be achieved mostly by heat rising from the socket, and supplemented by heat radiating from the resistor 9. Thus, the switch 1 can be switched on and off as appropriate in stages during the time the ambient air is warming up to the temperature set without the need to provide additional dedicated components.

It will be appreciated that, for applications where a neon lamp is not required, the live terminal of the socket may be used alone to achieve the accelerator heating.

Should any particular application require accelerator heat which is somewhat more than that provided for as described above, this may be achieved by providing an additional resistor of appropriate value across the live and neutral lines 2, 7 respectively on the load side of the switch 1, perhaps associated with a switch, in which case the "reaction time" of the thermostat can be adjusted by appropriately switching "in" or "out" the additional resistor.

CLAIMS

1. A plug-in thermostat for a heating appliance comprising a body provided with pins by which it may be plugged into an electric socket and with its own socket by which the heater appliance may be plugged in, temperature control being effected by thermostat contacts housed within the body, via manually adjustable setting means, characterised in that the thermostat contacts are arranged within the body at a position over said socket whereby heat emanating and rising from the socket in use provides the source of heat for accelerated heating

2. A thermostat according to Claim 1, characterised in that the contacts are arranged immediately adjacent and substantially vertically above the thermostat socket.

3. A thermostat according to Claim 1 or 2, and having a load indicator circuit, comprising a neon indicator and a resistance connected in series, characterised in that said resistance is arranged near the thermostat contacts whereby heat generated by said resistance supplements the heat emanating from said socket.

4. A thermostat according to any one of Claims 1 to 3, characterised in that the body of the thermostat is provided with bottom and top parts defining vents so that convection currents produced by the heat emanating from said socket will cause an air draught to rise through a suitable passage through the thermostat body, and hence entrain said heat and guide it over the thermostat contacts.

5. A plug-in thermostat constructed, arranged, and adapted for use substantially as hereinbefore described with reference to and as shown in the accompanying drawing.

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